

CLAIMS

1 An RF treatment apparatus, comprising:
2 a catheter including a catheter lumen;
3 a removable needle electrode positioned in the catheter lumen in
4 a fixed relationship to the catheter, the treatment needle electrode
5 including a needle lumen and a needle electrode distal end;
6 a return electrode;
7 a removable introducer slidably positioned in the treatment
8 needle lumen, the introducer including an introducer distal end;
9 a first sensor positioned on a surface of the needle electrode or
10 the introducer;
11 an RF power source coupled to the treatment needle electrode;
12 and
13 resources associated with the first thermal sensor, return
14 electrode and the RF power source for maintaining a selected power at
15 the electrode independent of changes in current or voltage.

1 2. The RF treatment device of claim 1, further comprising:
2 an infusion device including an infusion device lumen, the
3 catheter being at least partially positioned in the infusion lumen and
4 removable therefrom.

1 3. The RF treatment apparatus of claim 1, further comprising:
2 an insulator, with an insulator distal end, positioned in the
3 catheter lumen in a surrounding relationship to the needle electrode, the
4 insulator being slidably positioned along a longitudinal axis of the
5 treatment needle electrode to define a needle electrode conductive
6 surface beginning at the insulator distal end;

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1 4. The RF treatment apparatus of claim 1, wherein the first
2 sensor is positioned at the introducer distal end.

1 5. The RF treatment apparatus of claim 3, further comprising:
2 a second sensor associated with the resources and positioned on
3 a surface of the insulator.

1 6. The RF treatment apparatus of claim 1, wherein the
2 needle electrode distal end is sharpened.

1 7. The RF treatment apparatus of claim 6, wherein the
2 introducer distal end is sharpened.

1 8. The RF treatment apparatus of claim 7, wherein the
2 introducer distal end is substantially flush with the needle electrode
3 distal end when positioned at the treatment needle electrode distal end.

1 9. The RF treatment apparatus of claim 1, wherein the
2 needle electrode includes a plurality of fluid distribution ports.

1 10. The RF treatment apparatus of claim 1, wherein the
2 needle electrode is operated in a bipolar mode.

1 11. An RF treatment apparatus, comprising:
2 a catheter including a catheter lumen;
3 an insert removably positioned in the catheter lumen in a fixed
4 relationship to the catheter, the insert including an insert lumen and an
5 insert distal end;
6 an removable electrode positioned in the insert, the electrode
7 having an electrode distal end that advances out of the insert distal end
8 and introduces RF treatment energy along a conductive surface of the
9 electrode;
10 a return electrode;
11 a first sensor positioned on an electrode or insert surface;
12 an RF power source coupled to the electrode; and
13 resources associated with the thermal sensor, return electrode
14 and the RF power source for maintaining a selected power at the
15 electrode independent of changes in voltage or current.

1 12. The RF treatment apparatus of claim 11, further
2 comprising:
3 a removable introducer slidably positioned in the insert lumen, the
4 introducer having an introducer distal end that reduces an entry of
5 material into the insert distal end as the insert is advanced through a
6 body structure.

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1 13. The RF treatment apparatus of claim 11, further
2 comprising:

3 an insulator, with an insulator distal end, positioned in a
4 surrounding relationship to the electrode, the insulator being slidable
5 along a longitudinal axis of the needle electrode to define an electrode
6 conductive surface beginning at the insulator distal end.

1 14. The RF treatment apparatus of claim 11, wherein the
2 electrode is advanced out of the insert distal end in a lateral direction
3 relative to a longitudinal axis of the insert.

1 15. The RF treatment apparatus of claim 11, wherein the first
2 sensor is positioned on an electrode surface.

1 16. The RF treatment apparatus of claim 11, further
2 comprising:
3 a second sensor associated with the resources and positioned on
4 an insulator surface.

1 17. The RF treatment apparatus of claim 11, further
2 comprising:
3 a transponder positioned on an electrode surface.

1 18. The RF treatment apparatus of claim 17, wherein the
2 transponder is positioned on the electrode distal end.

1 19. The RF treatment apparatus of claim 11, wherein the
2 electrode is hollow and includes a plurality of fluid distribution ports.

1 20. The RF treatment apparatus of claim 11, further
2 comprising:
3 an infusion device including an infusion device lumen, the
4 catheter being at least partially positioned in the infusion device lumen
5 and removable therefrom.

1 21. The RF treatment apparatus of claim 11, wherein the
2 electrode distal end is sharpened.

1 22. The RF treatment apparatus of claim 11, wherein the
2 electrode operates in a bipolar mode.

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23. An RF treatment apparatus, comprising:
an infusion device including an infusion device lumen;
a catheter including a catheter lumen, the catheter being at least partially positioned in the infusion device lumen and removable therefrom;
a removable needle electrode positioned in the catheter lumen in a fixed relationship to the catheter, the needle electrode including a needle lumen;
a return electrode;
an insulator, with an insulator distal end, in a surrounding relationship to the needle electrode, the insulator being slidably positioned along a longitudinal axis of the needle electrode to define a needle electrode conductive surface beginning at the insulator distal end;
a first sensor positioned on an electrode or insulator surface;
an RF power source coupled to the treatment needle electrode;
and
resources associated with the first thermal sensor, return electrode and the RF power source for maintaining a selected power at the electrode independent of changes in voltage or current.

24. The RF treatment apparatus of claim 23, further comprising:
a removable introducer slidably positioned in the needle electrode lumen with an introducer distal end.

25. The RF treatment apparatus of claim 24, further comprising:
a second sensor associated with the resources and positioned on a surface of the introducer.

1 26. The RF treatment apparatus of claim 23, wherein the
2 catheter is removable from the infusion device, while the infusion device
3 remains positioned in a body structure.

1 27. The RF treatment apparatus of claim 24, wherein the
2 catheter, treatment needle electrode, insulator and removable introducer
3 are all removable from the infusion device lumen, while the infusion
4 device remains positioned in a body structure.

1 28. The RF treatment apparatus of claim 24, wherein the
2 needle electrode distal end is sharpened.

1 29. The RF treatment apparatus of claim 28, wherein the
2 introducer distal end is sharpened.

1 30. The RF treatment apparatus of claim 29, wherein the
2 introducer distal end is flush with the treatment needle electrode distal
3 end when positioned at the treatment needle electrode distal end.

1 31. The RF treatment apparatus of claim 23, wherein the
2 needle electrode includes a plurality of fluid distribution ports.

1 32. The RF treatment apparatus of claim 23, wherein the
2 needle electrode operates in a bipolar mode.

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